

**Plan Review Task Force  
Mecklenburg County**

# **Final Report to the Building Development Commission**

**On the commercial plan review and permitting process**

**June 14, 2000**

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**Plan Review Task Force**  
**Final Report to the Building Development Commission**

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## **Executive Summary**

Code enforcement authorities are often graded on the time required to obtain a permit. While Engineering & Building Standards (E&BS) maintains demanding goals and achieves these goals on a regular basis, over time the development and professional community has questioned the overall permitting time. In April 1999, E&BS presented a report to the Building Development Commission (BDC) showing:

- Department first review time goals of 5 work days for small projects and 15 work days for large projects (exclusive of time to enter the computer system);
- For 200 projects studied, average first review time of 8 work days for small projects and 18 work days for large projects (including time to enter the system);
- For 200 projects studied, average permitting time of 30 work days for small projects and 58 work days for large projects.

The BDC challenged the Department, American Institute of Architects – Charlotte Section (AIA-C) and the Professional Engineers of North Carolina – South Piedmont Chapter (PENC) to develop a strategy to close the gap between the first review time and permitting time. In response to this challenge, the Plan Review Task Force was created and began working on the problem in November 1999.

Over the last 8 months, the Task Force convened on a bi-weekly basis to grapple with the general problem of how best to reduce the time required to issue permits in Mecklenburg County. Throughout 15 meetings, attendance from both the professionals and Department was strong, and as a result a comprehensive strategy was shaped as the consensus of the Task Force.

The strategy proposed by the Task Force, as described in the following pages, is wide ranging, touching on both process changes within the Commercial Permits Core Process, as well as a need for greater code compliance accountability on the part of practicing professional. Some of the key conclusions the Task Force agreed to, are as follows.

- The Department needs to aggressively review the current commercial project plan review process, removing valueless steps. Unnecessary reviews need to be weeded out of the system. Projects requiring minimal reviews need to be given a rapid process track separate from the other small and large projects
- AIA-C, Consulting Engineers Council (CEC), and PENC need to significantly raise the bar for success on first reviews and second reviews. The professional associations need to make a clear statement that A&E offices should strive for a 75% success rate on first reviews and a 95% success rate on second reviews.
- Information flow between plan review and A&E's needs to change to a system which is more direct and immediate, cyclical rather than sequential. Professionals should have immediate access to plan review comments when any discipline is complete. Eventually, electronic plan review should allow professionals to make corrections on the spot, while discussing defects with the plan reviewer by phone.
- AIA-C, CEC and PENC need to emphasize the value of code compliance training and make courses available. E&BS should develop quarterly reports on plan review defects in the various disciplines, and the professional associations need to use this data to shape training programs targeting code compliance weaknesses.
- A significant financial disincentive needs to be put in place for those who abuse the permitting system by requiring 3<sup>rd</sup>, 4<sup>th</sup> or more plan reviews.
- Projects requiring 4 or more reviews should be slated as a lower priority than other projects in E&BS response time goals.
- A&E's with high plan review success rates should have an experienced professional path through the system. In addition, added resources should be devoted to novice or problem customers to keep them from clogging the system for responsible professionals.

- A&E's need to make greater use of existing Commercial Permits tools, specifically preliminary code reviews as well as the manual Plan Submittal Requirements for Commercial Projects.

These initiatives and many other points are discussed in greater detail in the following pages. Directly responding to the BDC initial challenge, the Task Force has organized this report into 3 groups of the best ideas, which we believe will constructively address each of the following concerns.

Part A: Closing the Gap Between and Permitting Times,

Part B: Improving the First Plan Review Success Rate,

Part C: Improving the Second Plan Review Success Rate,

Part D: Electronic Plan Submittal and Other Initiatives.

The Task Force is confident pursuit of the initiatives described in this report will significantly improve the commercial permit process in Mecklenburg County. Ultimately, these changes will place the owner's design team in greater control of the time required to gain a permit.

The completion of this report is just the beginning of this effort; there is much work remaining. The Task Force encourages the Department to assemble a team to begin addressing changes in the commercial plan review process at the earliest opportunity. Similarly, the professional associations (AIA-C, CEC, PENC and others) need to move quickly to underscore the responsibility each professional holds to produce code compliant documents. Success will be achieved only by strong action by all parties involved.

This report concludes the Task Force regular meeting schedule in response to the BDC's initial challenge. The Task Force remains available to periodically monitor the progress of initiative development, by both the department and the professional associations, should the BDC feel this is appropriate.

## **Part A: Closing the Gap between Review and Permitting Times**

The BDC's initial challenge to the Task Force included identifying the most effective way to quickly close the gap between the average first review time and the average overall time required to gain a permit. The following is a brief summary of 6 initiatives, by either the Department or the profession, which the Task Force believes will close this gap.

### **Item 1: Plan review comments made immediately available to A&E's**

- Timetable: Summer, 2000
- Description: The Department needs to find a way to move away from the current sequential flow of information between A&E's and plan review, and move toward information being made immediately available by trade. In this new information flow, A&E's would have electronic access to review comments as soon as any discipline is complete.

In the short term, A&E's would have to hold up re-submissions until all comments are made, all revisions are complete, and a new re-submission is made en masse. In the long term (2001), with electronic plan submittal, A&E's and plan reviewers would be able to discuss drawings during reviews, making corrections immediately for the plan reviewers approval.

### **Item 2: Have complete sets of drawings**

- Timetable: Summer, 2000
- Description: the E&BS document Plan Submittal Requirements for Commercial Projects has been in circulation for 2½ years, consequently, there is little reason for submissions to be incomplete. Construction documents, which are submitted prematurely or with incomplete information, represent a needless waste of both facilitation and plan review resources. The Department must find a way to keep incomplete sets out of the system, either by screening, or by a significant disincentive.

### **Item 3: Get unnecessary plan reviews out of the system**

- Timetable: Immediate
- Description: at the earliest opportunity, the Department needs to evaluate what reviews must be done to produce a high level of life safety, and support field inspections. All others review topics should be considered for discontinuation, with great care taken to mitigate any negative impact on field inspection response times.

### **Item 4: Keep small reviews out of the system**

- Timetable: Immediate
- Description: for small projects requiring minimal review, an abbreviated permitting process needs to be developed to keep these projects out of the mainstream review process servicing larger renovations, upfits and new construction. Ideally, these projects would be processed and permitted without entering the project tracking system, perhaps with the reviewer (CTAC) issuing the permit. This modified process would save time for both facilitation staff and the customer, at the same time hopefully achieving a first review pass rate far in excess of other projects.

### **Item 5: Create a commercial master plan program**

- Timetable: Six (6) Months
- Description: this tool has been very successful in the Residential Drawing Submittal Program and there is reason to believe it may be of use in Commercial Permits. While the exact demand is unknown, the best approach is most likely to put a Commercial Master Plan Program in place, advertise it and see if there is sufficient demand to justify the record system.

Any project using prototypical plans would be eligible. The project would go through a master plan review, receive a PIN number and thereafter submit only the PIN number and site plan for review. Prototype plan changes would be significantly restricted in this program. Significant field changes or use of invalid PIN numbers would revert the project to the normal review process.

**Item 6: Create two plan review tracks**

- Timetable: Six (6) Months
- Description: Create two separate tracks or “lanes” of plan review:
  - a) Experienced professional lane
  - b) Novice lane

The current system adheres rigidly to an order of submission prioritization plan; all projects are considered equal. In reality, projects vary greatly in level of expertise and quality of submission. It is not unusual for novice owner projects or poor sets of construction documents to clog up permitting resources on the scale of a much larger project. It is estimated that 70-80% of all projects would move through the permitting process faster if a separate track was created for projects with inexperienced owner/design teams.

## **Part B: Improving the First Plan Review Success Rate**

Projects submitted in Mecklenburg County have an exceedingly high first review failure rate. The Task Force recommends the following initiatives as the most effective tools to raise the first plan review pass rate from its current average of 21%.

### **Item 1: Greater use of “approved as noted” criteria**

- Timetable: immediate
- Description: Professionals periodically note plan review comments are so simple as to allow approval with a conditional note. Currently, there are no criteria in the permitting process for when or how plans could or should be “approved as noted”. While this is complicated by the fact not all disciplines have simple comments at the same time, the Task Force spent a considerable amount of time receiving suggestions for and shaping criteria for use of “approved as noted” by staff in the review process. The proposed “approved as noted” criteria are included in the appendix of this report.

The Task Force strongly recommends the proposed criteria be embraced by the Commercial Permits Process, and that plan reviewers make the widest use possible of “approved as noted” criteria, within the limits of litmus tests described in the criteria.

### **Item 2: A&E’s follow the plan submittal requirements closer; use as a checklist**

- Timetable: immediate
- Description: As noted in Part A, Item 2, E&BS first published Plan Submittal Requirements for Commercial Projects in November, 1997. This document is also currently posted on our web site, [www.co.mecklenburg.nc.us/coeng](http://www.co.mecklenburg.nc.us/coeng). Over the last 2½ years, while many firms have used this document extensively, a larger number of firms rarely verify drawing submission requirements in advance. This often leads to a first review failure, simply because required code information is absent.

The most successful firms have used Plan Submittal Requirements for Commercial Projects as a checklist, verifying submittal needs while their construction document package is still being assembled. Some firms take the extra step of confirming drawing content with the CEO during their preliminary code review. If all firms would embrace one or both of these steps, first review failures attributed to inadequate information would decrease significantly.

### **Item 3: Designer of record should be the point of contact on a submittal**

- Timetable: Fall, 2000
- Description: Currently, the point of contact during plan review is the permit applicant, more often than not, the contractor rather than the A&E’s on a project. This creates problems in communicating plan review comments, as they all go through the applicant. Consequently, the A&E’s receive their plan review comments second hand, if at all.

The Task Force believes first review success rates would improve, if the designer of record served the role of point of contact on all permit applications. All B/M/E/P/FP/Z comments then would circulate to the design team, through the designer of record, who would be responsible for coordinating all changes and re-submittals. The only exception suggested is on projects with no architect or engineer, the contractor would be allowed to assume the point of contact role if the owner so designates.

### **Item 4: Communication between A&E’s and plan review should be immediate by trade, not sequential**

- Timetable: December, 2000
- Description: Currently, all plan review comments are communicated en masse, on the completion of a review sequence (when all trade reviews are complete). This makes for a slow communication process, with some discipline comments in limbo for many days.

The Task Force proposes an electronic tool be placed in service which will make plan review comments immediately available to the project's architect or engineer. This would allow A&E's to get an early start on corrections, or contact the plan reviewer on misunderstood information. Similar tools are already in place in other jurisdictions.

Ultimately, electronic plan submittal should be pursued as a vehicle to allow plan reviewers to discuss code defects with A&E's on the screen by telephone. Ideally, A&E's would be able to make corrections on the spot, thus significantly increasing the rate of first review approvals. However, a significant roadblock must be addressed; how to speed up communication with A&E's (even by electronic plan submittal) while still holding project revisions/re-submissions in some organized and identifiable sequence. The solution to this problem must also respect A&E's need to identify all plan revisions by date.

**Item 5: Wider use of preliminary code reviews**

- Timetable: Immediate
- Description: See Part C, Item 7.

**Item 6: A&E offices need to have a higher level of code training/knowledge**

- Timetable: September, 2000
- Description: the Task Force reviewed the Study of Plan Review Defects Noted in meetings 6, 7 and 8. A copy of the study is included in this report appendix. The Task Force agreed the data in this study provides excellent targets for the A&E professional society training programs. The professional associations should provide responding training programs at the earliest opportunity. A&E offices should place their staff in these programs to obtain a higher level of code training and knowledge, which will significantly improve the office first review success rate.

**Item 7: A&E offices use of Quarterly Plan Review Defect Report**

- Timetable: April, 2001
- Description: The need for a Quarterly Plan Review Defect Report is discussed in Part C, Item 6 of this report. After the Defect Report is initiated, A&E's should use this report as a checklist on each project submitted to E&BS, including:
  - a) Check drawings for your disciplines most common code defects
  - b) Check drawings for your individual office's most common code defectsUse of checklists should significantly improve first review success rate.

**Item 8: Have an experienced professional path for A&E shops with a high approval rate**

- Timetable: April, 2001
- Description: As discussed in Part A, Item 6 of this report, the Task Force advocates having two separate tracks for plan review, one being an "experienced professional path". The "experienced professional path" would have plan review response time goals more aggressive than regular review tracks. Entry to the experienced professional path would be limited to design teams who consistently maintain a high plan approval rate.

**Item 9: Create an electronic tool to ensure that the reviewer on preliminary reviews and the reviewer at the time of permit application are one and the same.**

- Timetable: December, 2000
- Description: One of the most effective tools to improve plan review success rate is preliminary code reviews (See Part C, Item 7). To optimize the benefit of this process, we must assure that the reviewer at the time of permit application is the same as the preliminary reviewer. Two basic steps are required here:
  - Owner's team advises of preliminary reviewer name at the time of permit application
  - E&BS makes the same assignment for the final reviewE&BS should create an electronic assignment tool to assure these assignments are followed through.

## **Part C: Improving the Second Plan Review Success Rate**

After one round of review comments, projects continue to have difficulty effecting code compliance. The Task Force recommends the following initiatives as the most effective tools to raise the second plan review (re-review) pass rate from its current average of 62%.

### **Item 1: Extensive use of plan review markup criteria**

- Timetable: Immediate
- Description: Clarity in plan review comments is critical to a successful re-submission; if A&E's clearly understand the code issues in question, their ability to correctly address them is significantly enhanced.

Currently there is no recommended procedure for markup of plans, with each reviewer being left to their own preference. Though Mecklenburg County plan reviewers are highly skilled, their comment practices vary widely. Consequently, the Task Force spent a considerable amount of time receiving suggestions for and shaping criteria for how to effect the best set of plan review comments, thus optimizing communication between plan review staff and A&E's. The proposed Plan Review Markup Criteria is included in the appendix of this report.

The Task Force strongly recommends the proposed criteria be embraced by the Commercial Permits Process. Plan reviewers should begin using the Plan Review Markup Criteria at the earliest possible date.

### **Item 2: Electronic re-submittal tracking program**

- Timetable: December, 2000
- Description: Tracking of re-submittals is an Achilles Heal of the current permitting process. At the earliest opportunity, Commercial Permits should create an electronic tracking program for re-submittals to keep these projects from falling through the cracks. The program should flag any re-submitted project, which has been in the system longer than 5 workdays. The 5 workday criteria should be applied to all re-submittals, other than complex (schools, high rises, etc.) projects.

### **Item 3: Clear indications from professionals on how they have responded to plan review comments**

- Timetable: September, 2000
- Description: A common generator of 3<sup>rd</sup> and 4<sup>th</sup> reviews is failure by the design team to address all comments made by plan review staff. Development of a tool requiring professionals to answer all comments would undoubtedly raise second review pass rates significantly. To that end, the Task Force recommends two new re-submittal requirements.
  - a) A&E's should bubble all changes responding to E&BS comments
  - b) A&E's should provide a summary written response to E&BS indicating where and how the each plan review comment was addressed.

### **Item 4: Discourage third, fourth or more reviews by creating a system of added plan review charges**

- Timetable: December, 2000
- Description: The April 14, 1999 Commercial Plan Review Turnaround Study noted that 38% of all projects require more than two reviews. Rarely is there a good reason for a project to merit this extra allocation of resources. Projects necessitating third, fourth or more reviews abuse the permitting system and should be addressed. Consequently, the Task Force recommends implementing a system of added plan review charges for projects requiring three or more plan reviews. While the fine points of such a program are left to future definition, possible direction or details include:

- System design perhaps similar to the City of Raleigh's re-review charge program of \$800 for a large project; \$500 for a small project (see February 3 meeting notes)
- Preference for an added charge by the hour if possible
- Professional members of the Task Force wish to participate in the detail development of this Plan Review Charge System

**Item 5: Lower the priority of projects submitted for a fourth review**

- Timetable: Immediate with 60 days' notice
- Description: The Task Force recommends a process revision: for projects which fail the third review, lower the priority on the next re-review (fourth or later review). These projects should be sent to the back of the line where the response time goal is 15 days, in contrast to the normal 5 day response time goal for re-reviews. This will free up resources for other projects, while at the same time serving as a disincentive with respect to poor construction documents.

**Item 6: Initiate a Quarterly Plan Review Defect Report**

- Timetable: April, 2001
- Description: Dissemination of plan review defects data is key to focusing on where the various disciplines have trouble understanding the building code or local ordinances and, in the long term, driving plan review success rate up. This data will allow both the professional associations and individual offices to address the weak areas in their knowledge of the building code. Consequently, the Task Force recommends, at the earliest opportunity, E&BS develop a summary report of plan review defects noted by discipline (building, mechanical, electrical, plumbing, fire protection and zoning), for posting on the Internet.

**Item 7: Greater use of preliminary code reviews**

- Timetable: Immediate
- Description: Over the last four years, preliminary code reviews have proven their usefulness in elevating the quality of code compliant drawings submitted for permit. While no hard data exists, the general consensus among E&BS staff is that projects using preliminary code reviews, by and large, have a far higher plan review success rate than other projects. The challenge is to move all professional offices to recognize the value and benefits of this tool. To that end, the Task Force recommends the professional associations and E&BS make an ongoing, concerted effort to promote greater use of preliminary code reviews by the professional community.

**Item 8: Communication between E&BS and local professionals.**

- Timetable: Immediate
- Description: Ongoing communication between E&BS and the profession is critical if we are to successfully drive the plan review failure rate down and hold it down. Consequently, the Task Force recommends E&BS hold semi-annual Q&A sessions with the professional associations, reviewing programs, current initiatives and problems from both sides.

## **Part D: Electronic Plan Submittal and Other Initiatives**

Further discussions warrant pursuing an electronic plan submittal process, thereby alleviating the “paper flow”. The Task Force identifies the following possible avenues to pursue.

### **Item 1: Electronic Plan Submittal**

#### **Item 1A: Need for electronic plan submittal**

- Timetable: Immediate
- Description: As technology continues to change, the need for electronic plan submittal will be inevitable. In an effort to embrace this technology now, rather than later, the Task Force has identified some concerns which include the following:
- Compatibility with all formats of computer drafting
- A&E’s may continue to generate drawings manually
- Generation of documents for the field – is the best method, paper, electronic or a mixture of both.

#### **Item 1B: Investigate and choose vendor**

- Timetable: Immediate
- Description: Begin immediately investigating and identifying a probable vendor who will effect a pilot program that will test both automation of the manual system, while also complementing the other current systems in place. The system will track projects from first review to permitting and allow A&E’s and E&BS to communicate in a “real-time” environment to ensure a first-time approval and shorten the review time.

#### **Item 1C: Pilot a test program**

- Timetable: December, 2000
- Description: As A&E’s support the idea of an electronic submittal pilot, the Task Force will identify A&E’s (both a large and a small firm) who will support and also test the pilot. The pilot should identify advantages and disadvantages in converting to an electronic plan submittal process.

### **Item 2: Switch to plan review comments in note form**

- Timetable: Immediate
- Description: The department should pursue this as far as possible. Switching to plan review comments in numbered note form would provide the A&E’s the opportunity to begin working on changes as each trade has completed their review. Another advantage to this method is that electronic mail could be utilized reducing the amount of paper created in the review process, and assure positive communication of comments with A&E’s. In turn, A&E’s could respond to each comment, assuring follow through on review concerns.

### **Item 3: Format of plans issued to field**

- Timetable: Concurrent with Item 2 above
- Description: Plans are currently issued to the field in a confusing mix of revised sheets, sometimes of several generations. This system should be replaced with a process producing one set with all comments clearly identified. In all likelihood, to effect this, the department will have to:
  - a) Develop an electronic sign off process,
  - b) Switch to plan review comments in note form, and
  - c) Assign A&E’s with responsibility for inserting revised sheets (refer to Meeting Notes 13 and 14).

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## **Appendix**

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# Attendance Summary

Name	Representing	Organization	#1 11/11	#2 12/2	#3 12/21	#4 1/6	#5 1/20	#6 2/3	#7 2/17	#8 3/2	#9 3/16	#10 3/30	#11 4/13	#12 4/27	#13 5/11	#14 5/25	#15 6/8	Total
Bartl, Jim	E&BS	EB&S	X	X	X	X	X	X	X	X	X	X		X	X	X	X	14
Barton, Steve	AIA	David Furman Arch.	X	X	X	X	X	X	X			X	X			X	X	11
Blackwood, Barry	PENC	F. N. Thompson					X	X	X		X							3
Brigham, Dale	AIA	Little & Associates	X	X	X	X	X	X	X	X	X	X		X	X	X	X	15
Burkhard, Michael	EB&S	EB&S					X	X	X		X				X			4
Copeland, Jack	AIA	E. H. Copeland, Jr.	X	X				X		X	X		X	X		X		8
Duignan-Woods, Eileen	PENC	EDW Associates	X	X	X	X	X	X	X			X		X	X			10
Dulin, Bob	EB&S	EB&S			X	X	X	X	X	X	X	X		X	X	X		13
Hartsell, Bill	AIA	Freeman-White Inc.		X	X	X	X			X	X					X		7
Turner, Tom	BDC	ADEP Architects		X														1
Walker, Chuck	EB&S	EB&S		X	X	X	X	X	X			X	X		X	X	X	11
			5	8	7	7	7	9	8	5	7	6	5	5	6	7	5	97

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## Approved as Noted Criteria

In the interest of promoting the use of “approved as noted” as a tool to expedite plan reviews with few comments, the Plan Review Task Force recommends the following criteria.

### Part I: General Criteria

- a) Litmus test I:
  - Could you markup the “approved as noted” items on both sets in 5 minutes or less?
- b) Litmus test II:
  - Must be a minor simple stand alone item, not part of a large assembly (example: exit sign vs. rated wall)
  - Must be easily verifiable in the field, not covered up on the finish
  - Should be easily convertible in the field if missed (example: changing a door swing)
- c) If so, the plan reviewer should call, fax or e-mail the A and E advising of use of “Approved as Noted” option
  - Contact should indicate item, sheet number and code section
  - E&BS will assume ok to proceed, but A & E may decline “approved as noted”
- d) A or E should fax or e-mail a return memo indicating message received and understood. Memo goes in file. Facilitator checks to be sure memo received before issuing permit.
- e) Where more than one discipline is involved in a project, “approved as noted” should only be used if there is a project architect in the lead
  - Architect will be copied on any memos to the engineer
  - Architect will be responsible for coordination of code compliance issues in all other disciplines, raised by the “approved as noted” item.
- f) All plan reviewers, as a group, should strive to use this criteria in a consistent and uniform manner.

Part II: Examples of revisions, which benefit from use of “Approved as Noted”, if they are the only outstanding comment.

#### IIA. Building review examples

- Tempered glass required
- Lever locks required
- Mislabeled doors
- Revising a door swing
- Horn strobes missing
- Adding an exit light
- Clarification of material details
- Adjustment of detail dimensions (handrail heights, etc)

#### IIB. MEP-FP review examples

- Wire size
- Exhaust fan (small)
- Manual pull stations
- Fire dampers
- Fire hydrant location
- Fire department pumper connection
- Missing sprinkler heads

- Additional fire strobe
- Trap on floor drain
- Vent stack size
- Floor drain clean out
- Hi-low drinking fountain.

Part III: examples of items which should not be eligible for use of “approved as noted”

- Nothing changing the design (impacting partition or space layout)
- Ramps vs. steps
- Wall ratings

## **Plan Review Markup Criteria**

In the interest of creating consistency among all reviewers in their approach to reviewing plans, the Plan Review Task Force recommends the following steps be adopted as performance criteria for plan review staff, on either a voluntary or required basis.

## **Part I: General Criteria**

1. There are four items you should have prior to reviewing any plan.
  - A) checksheet(s), b) the plans, c) the folder and d) the specifications (if provided); each is an integral part of the review.
  - To avoid projects turned down because the reviewer does not see letters in folders and specifications, gathering all the project information is vital.
2. The plan checksheet content should be an outline of the most important sections of the code with some space left to handle any special circumstances the occupancy presents.
  - If forms don't reflect the vital code sections, they should be revised accordingly.
3. The typed name and phone number of the reviewer should be checked on every checksheet so the designer can readily identify the reviewer to contact them with questions about the project.
4. All of the approved/disapproved boxes on the checksheet should be filled in and identified as to the reviewer's intention on that particular code item.
  - The symbols for approval, disapproval and not applicable should appear on the check sheet.
5. The sheet number of each plan that is turned down for a particular code item with red lined comments should be added to the box on the check sheet with that designated code article.
  - The designer can then readily identify which particular code article is in question at which location.
6. Include any notes that may be needed to clarify any of the items you have turned down, however, most of the notes should be on the plans.
7. Review the plan folder.
  - There may be a letter from the engineer, a job narrative of special occupancy issues, letters on the job pre-review assumptions and problem resolutions, Department of Insurance letters, information from outside agencies (such as DFS or Health), and finally the permit application itself which contains utility information for plumbing and electrical
  - The comments of other reviewers should be scanned to see if their comments could impact your review
8. If the specifications are missing from the plan and the plan cover sheet does not say "spec" then a call to the designer will prevent undue delay in the project. The Architect is usually prompt in responding to your request for specifications.

## **Part II: Review Criteria**

1. Quickly go through the entire set of plans starting with the appendix "B", the site plan, and the ASPMEF, to get a feel for the overall design of the job.
  - Look for quick discoveries about the coordination of the plans and identify any problems that need to be resolved by you or another trade reviewer before a plan can be approved.

2. Be sure to inform other reviewers, either by note on the front of the plan, (for reviewers who have not yet reviewed the plan), or direct contact with reviewers who have completed the review and missed a potential code problem during their review.
3. During the project review, be sure to make clear and concise comments on the plans with identifying code articles noted where applicable.
4. Provide attachments for clarity.
  - Some examples of attachments for M/P plans include the kitchen hood, roof drain and scupper calculations for rainfall in the Charlotte area, refrigeration (type, quantity, calculations, and alarms), and oil/water and grease interceptor requirements unique to Mecklenburg County.
5. In the case where an Architect or Engineer may put A/M/P/E on the same plan sheet, reviewers should put the letter of the trade they review above each comment they make to avoid confusion for the designer and the reviewer on calls from the designer.
6. Try to resolve code conflicts before they escalate
  - Get advice on the problem from all available sources before you contact the designer; this may include other reviewers, the trade Chiefs, and DOI.
  - Always give the designer the number of others that you may defer to for an alternate decision.
7. Return the designers calls as soon as you can.
  - Always leave a message that you returned the call with clerical personnel or voice mail if the designer is not in.
  - If the designers question can be answered on voice mail without playing “ phone tag”, use this option.
  - Try to fax the designer any information “within reason” that will clarify a code conflict.

**Mecklenburg County  
Engineering & Building Standards**

**Commercial Permits Core Process**

**Study of Plan Review Defects Noted**  
**For the period November 1 to December 31, 1999**

**January 26, 2000, rev March 21, 2000**

# Introduction

The following study was assembled as an aid to both the Commercial Permits CP and the Plan Review Task Force in identifying areas of improvement for the Department and profession. The data represents plan review staff comments on all projects reviewed in the office between November 1, 1999 and December 31, 1999. In contrast to the April 8, 1999 Plan Review Turnaround Study, this report tracks reviews, not projects, so not all reviews for all projects are included, especially in early November and late December. In total, approximately 2400 discipline reviews are included in the study, representing approximately 1000 projects in various stages. The projects breakdown into 55% small and 45% large; the “small” and “large” project designation reflecting plan review resources required, and not necessarily project size.

The report is organized into 3 parts.

1. Summary of defects by plan reviewer: lists by discipline and reviewer totals for large and small projects, first time approvals and total number of reviews.
2. Summary of most common defects: lists by discipline the top defects sighted on either large projects or small. These are excellent targets for AIA-C and PENC training courses.
3. Detailed defect data: composite summary of all data extracted from plan review comment sheets, broken down by discipline, large and small projects and all review defect categories noted..

## What the data means

The Plan Review Task Force discussed this study in meetings #6, 7 and 8. While various conclusions can be drawn from details, generally the Task Force agreed on the following large scale points.

- It is important to identify differences in defects between large and small projects.
- Roughly half of all discipline defects are easily identified and should be immediately targeted for training by AIA-C and PENC.
- Projects with multiple discipline reviews fail far more frequently than projects with single discipline reviews (roughly 30% more often).
- In small projects, building and electrical disciplines fail far more frequently than on large projects. We need to identify why and if A&E's are involved in this high rate.
- Training should be heavily focused on building, electrical and zoning reviews, as these have the highest failure rates.
- Zoning review defect rates are surprising and merit particular attention by AIA-C.

This report was assembled from review sheets used as a normal part of all daily reviews. No filtering of projects was performed in assembling the data. Data summaries were developed by outside contract help, consequently we believe the margin of error is minimal.

## Summary of Most Common Defects 01/21/00

### 1. Building review

<b>Building small project defects</b>	<b>defect #</b>	<b>% of total</b>	<b>notes</b>
Accessibility req't, Vol 1-C	92	17.13%	
Doors (1012) ramps (1013) B porch (1014) g'rail (1015)	46	8.57%	
inter wall constr (T704), tenant sep	40	7.45%	
egress width (T1004), exits, stair/door/corr	38	7.08%	
arch/eng seal (GS 83-13) App B	37	6.89%	
total all defects	537		

<b>Building large project defects</b>	<b>defect #</b>	<b>% of total</b>	<b>notes</b>
Accessibility req't, Vol 1-C	94	17.03%	
struct loads (ch16) found (ch18) coner (ch15)	48	8.70%	
arch/eng seal (GS 83-13) App B	42	7.61%	
stair: prot (1006), constr (1007) horiz Ex (1009) disch (1010)	31	5.62%	
light & vent'l (ch12), energy (vol 1, ch13, vol10)	29	5.25%	
total all defects	551-		

### 2. Electrical review

<b>Electrical small project defects</b>	<b>defect #</b>	<b>% of total</b>	<b>notes</b>
load calculations (110)	91	12.01%	
overcurrent device on branch (210/220/240)	84	11.08%	
disconnects (422,424,430,440,680-12)	55	7.26%	
energy code (401, vol10)	54	7.12%	
overcurrent feeders (220,240)	43	5.67%	
total all defects	758		

<b>Electrical large project defects</b>	<b>defect #</b>	<b>% of total</b>	<b>notes</b>
overcurrent device on branch (210/220/240)	40	9.01%	
load calculations (110)	35	7.88%	
overcurrent feeders (220,240)	30	6.76%	
energy code (401, vol10)	30	6.76%	
fixed elect heat/ac (424/440)	27	6.08%	
total all defects	444		

### 3. Zoning review

<b>Zoning small project defects</b>	<b>defect #</b>	<b>% of total</b>	<b>notes</b>
Screening	41	15.59%	
Buffers	33	12.55%	
letter of compliance	30	11.41%	
dumpster/trash handling with screening	27	10.27%	
parking requirements	22	8.37%	
total all defects	263		

<b>Zoning large project defects</b>	<b>defect #</b>	<b>% of total</b>	<b>notes</b>
Screening	62	15.12%	
subdivision plans approved	49	11.95%	
dumpster/trash handling with screening	46	11.22%	
backflow preventor location	44	10.73%	
Buffers	43	10.49%	
total all defects	410		

#### 4. County fire review

##### Fire small project defects

	defect #	% of total	notes
sprinkler system	6	30.00%	
fire hydrant spacing	5	25.00%	
available water supply	3	15.00%	
fire alarm system	3	15.00%	
total all defects	20		

##### Fire large project defects

	defect #	% of total	notes
private fire main	22	30.99%	
fire department access	11	15.49%	
smoke detection system	11	15.49%	
standpipe system	7	9.86%	
fire hydrant spacing	5	7.04%	
total all defects	71		

#### 5. Mechanical review

##### Mechanical small project defects

	defect #	% of total	notes
equipment approval	25	15.63%	
ventilation/exhaust system	17	10.63%	
gas piping	17	10.63%	
fan shutdown controls	13	8.13%	
fire/radiation/smoke dampers	12	7.50%	
total all defects	160		

##### Mechanical large project defects

	defect #	% of total	notes
fan shutdown controls	25	11.79%	
ventilation/exhaust system	17	8.02%	
fire/radiation/smoke dampers	17	8.02%	
equipment approval	16	7.55%	
chimney & vents	15	7.08%	
vent termination	15	7.08%	
total all defects	212		

#### 6. Plumbing review

##### Plumbing small project defects

	defect #	% of total	notes
backflow protector	20	10.36%	
drain pipe installation	18	9.33%	
water heaters/boiler	16	8.29%	
water piping requirements	16	8.29%	
fixture requirements	15	7.77%	
material, tables	15	7.77%	
vent stacks, main vent	15	7.77%	
total all defects	193		

##### Plumbing large project defects

	defect #	% of total	notes
water piping requirements	39	10.29%	
drain pipe installation	35	9.23%	
backflow protector	28	7.39%	
cleanouts, traps	25	6.60%	
water heaters/boiler	25	6.60%	
accessibility requirements	24	6.33%	
total all defects	379		

### PROJECTS DEFECTS SUMMARY

<b>BUILDING REVIEWERS</b>	<b>FAILED SMALL PROJECTS</b>	<b>FAILED LARGE PROJECTS</b>	<b>1<sup>ST</sup> TIME APPROVALS</b>	<b>TOTAL # OF PROJECTS</b>
DAVID GARDNER	15	17	18	50
DURALL LeGRONE	33	35	116	184
STEPHEN LINEBERGER	33	3	11	47
GARY McCRAKEN	27	27	113	167
LON McSWAIN	15	29	23	67
HAROLD SINCLAIR	37	1	21	59
CHUCK WALKER	2	6	8	16
<b>TOTAL # OF PROJECTS</b>	<b>162</b>	<b>118</b>	<b>310</b>	<b>590</b>
<b>ELECTRIC REVIEWERS</b>	<b>FAILED SMALL PROJECTS</b>	<b>FAILED LARGE PROJECTS</b>	<b>1<sup>ST</sup> TIME APPROVALS</b>	<b>TOTAL # OF REVIEWS</b>
GARY HARVELL	45	21	77	143
GARY MULLIS	125	7	109	241
JOHN WALLER	16	6	23	45
JOE WEATHERS	18	47	30	95
<b>TOTAL # OF PROJECTS</b>	<b>204</b>	<b>81</b>	<b>239</b>	<b>524</b>
<b>ZONING REVIEWERS</b>	<b>FAILED SMALL PROJECTS</b>	<b>FAILED LARGE PROJECTS</b>	<b>1<sup>ST</sup> TIME APPROVALS</b>	<b>TOTAL # OF REVIEWS</b>
JOHN EAVES	15	5	80	100
RON JONES	22	87	17	126
KAM MERRELL	32	14	132	178
<b>TOTAL # OF PROJECTS</b>	<b>69</b>	<b>106</b>	<b>229</b>	<b>404</b>
<b>COUNTY FIRE REVIEWERS</b>	<b>FAILED SMALL PROJECTS</b>	<b>FAILED LARGE PROJECTS</b>	<b>1<sup>ST</sup> TIME APPROVALS</b>	<b>TOTAL # OF REVIEWS</b>
WILLIAM LAMAY	10	28	92	130
<b>TOTAL # OF PROJECTS</b>	<b>10</b>	<b>28</b>	<b>92</b>	<b>130</b>
<b>MECHANICAL REVIEWERS</b>	<b>FAILED SMALL PROJECTS</b>	<b>FAILED LARGE PROJECTS</b>	<b>1<sup>ST</sup> TIME APPROVALS</b>	<b>TOTAL # OF REVIEWS</b>
WILLIS HORTON	2	15	32	49
TYLER PACE	29	11	144	184
GLENN SNYDER	2	9	6	17
CHARLIE SUTTON	12	3	40	55
<b>TOTAL # OF PROJECTS</b>	<b>45</b>	<b>38</b>	<b>222</b>	<b>305</b>
<b>PLUMBING REVIEWERS</b>	<b>FAILED SMALL PROJECTS</b>	<b>FAILED LARGE PROJECTS</b>	<b>1<sup>ST</sup> TIME APPROVALS</b>	<b>TOTAL # OF REVIEWS</b>
WILLIS HORTON	1	21	32	54
TYLER PACE	30	31	140	201
GLENN SNYDER	5	9	5	19
CHARLIE SUTTON	16	3	39	58
<b>TOTAL # OF PROJECTS</b>	<b>52</b>	<b>64</b>	<b>216</b>	<b>332</b>

## SMALL PROJECT DEFECTS BY BUILDING REVIEWERS

SMALL BUILDING	DAVID GARDNER (15)	DURALL LEGRONE (33)	STEVEN LINEBERGER (33)	GARY MCCRACKEN (27)	LON MCSWAIN (15)	HAROLD SINCLAIR (37)	CHUCK WALKER (2)	TOTAL SMALL (162)
ARC/ENG SEAL GS83-13 VOL.1 SEC.104.2.3-APP.B.	2	10	2	12	7	3	1	37
OCCUP:A(LG__SM__) B E CH3&4 FH__ I IR M R__ S__ MIXED	0	4	1	1	1	5	0	12
LG.FL. GROSS AREA_____ T500 %AREA INCR.____SEC.503&503.4	0	0	0	1	5	3	0	9
BLDGHTSTORIEST500&SEC503.2	0	0	1	2		1	0	4
HIGH RISE 412 BSMT. 503.2.4 MEZZ. SEC 503.2.3 & 1005.6	0	3	1	0	1	0	0	5
CONSTRUCTION TYPE CH.6 & T600 1 2 3 4 5 UNPRT PRT SPK	1	2	1	3	3	2	0	12
HORIZ.SEP.DIST.T600 & SEC.504 DIST. TO DEED/ASSUME PR. LINE	0	1	3	1	4	0	0	9
EXT.WALLRATING____%OPENT600PROT. EXTWALLOPENSEC.705	0	0	3	1	2	0	0	6
701.4 709 TEST#____OF RATED MEMBER/ASSEMBLY T600,CH7	0	1	11	2	1	4	1	20
INTER.WALL CONST704.2/609 TENANT SEP.____704.3	1	3	17	6	4	9	0	40
____HR. OCCUP.SEP.303/CH4/704 FIRE WALL CONST.SEC.704.5	1	0	11	3	1	3	1	20
FIRE RATING:SHAFTS__STAIRS T700 705&1006 ATRIUMS 414	1	2	9	2	1	1	1	17
INTERIOR OPENING PROT. T700,704.2, 705, 1005.3	0	4	14		1	4	0	23
CALC. FIRE RESISTANCE 709 INTERIOR FINISHES CH.8,T803.3	2	1	9	1	0	0	0	13
FIRE PROT:SPRK903 STDPIP904 ALARS905,SMOKE DETEC.905.2	2		3	4	0	2	0	11
OCCUP.LOAD T1003.1,TRAVEL DIST._DEADEND_T1004,1012.1.3	0	2	9	2	0	1	0	14
EGRESS WIDTH T1004, CH.10 # EXITS, STAIR/DOOR/CORR.	0	6	17	4	2	9	0	38
STAIR:PROT.1006,CONSTR. 1007 HZ.EXIT.1009 DISCHARGE 1010	1	4	15	3	2	2	0	27
DOORS 1012 RAMPS 1013 BALC.PORCH.1014 GURAIL 1015	2	5	25	6	5	2	1	46
EXIT:ILLUM.\$SIGNS 1016 SPECIAL EGRESS REQ.1018	0	3	13	4		3	0	23
HANDICAP REQ.VOL.1-C PARK. SPACES/RAMPS/TOILETS	8	22	27	13	10	11	1	92
LIGHT&VENTILATION CHAP.12 ENERGY VOL.1 CH.13 & VOL10	0	2	7		3	0	0	12
EXT.WALLCOV CHAP.14 ROOF CONSTR. CHAP.15	1		5	1	0	0	0	7
STRUC LOADS CH.1600 FOUND.CH18 CONCR. CH15	8	5	7	1	2	0	0	23
MASONRY CH20 STEEL CH22 WOOD CH23 GLASS CH24	2		7	3	1	0	0	13
GYP.BD.CH.25 PLASTIC CH26 CHIMNE CH28 ELEVATOR CH.30	0	0	1	0	0	0	0	1
TENT/WKWY/TUN CAN/SIGNS CH31,32,33	0	0	3	0	0	0	0	3
EXISTINGBLDG:VOL1CH34VOL9	0	0	0	0	0	0	0	0
PIER&WATERWAYSTRUC.CH36ALT.MET H&MATVOL1-A	0	0	0	0	0	0	0	0
<b>TOTAL DEFECTS</b>	<b>32</b>	<b>80</b>	<b>222</b>	<b>74</b>	<b>56</b>	<b>65</b>	<b>6</b>	<b>537</b>

## LARGE PROJECT DEFECTS BY BUILDING REVIEWERS

LARGE BUILDING	WILLIS HORTON (15)	TYLER PACE (11)	CHARLIE SUTTON (3)	GARY MCCRACKEN (27)	LON MCSWAIN (29)	HAROLD SINCLAIR (1)	CHUCK WALKER (6)	TOTAL LARGE (118)
ARC/ENG SEAL GS83-13 VOL.1 SEC.104.2.3-APP.B.	5	5	1	10	12	1	8	42
OCCUP:A(LG__SM__) B E CH3&4 FH__ I R M R__ S__ MIXED	0	1	1	1	2	1	1	7
LG.FL. GROSS AREA_____ T500 %AREA INCR.____SEC.503&503.4	5	3	0	1	4	0	1	14
BLDGHTSTORIEST500&SEC503.2	0	3	1	1	1	0	2	8
HIGH RISE 412 BSMT. 503.2.4 MEZZ. SEC 503.2.3 & 1005.6	0	2	2	1	1	0	1	7
CONSTRUCTION TYPE CH.6 & T600 1 2 3 4 5 UNPRT PRT SPK	2	4	2	3	4	1	3	16
HORIZ.SEP.DIST.T600 & SEC.504 DIST. TO DEED/ASSUME PR. LINE	1	6	2	1	1	0	5	16
EXT.WALLRATING____%OPENT600PROT.EX TWALLOPENSEC.705	2	7	2	1	3	0	2	17
701.4 709 TEST#____OF RATED MEMBER/ASSEMBLY T600,CH7	2		1	2	4	0	1	8
INTER.WALL CONST704.2/609 TENANT SEP.____704.3	2	2	1	5	3	0	2	15
____HR. OCCUP.SEP.303/CH4/704 FIRE WALL CONST.SEC.704.5	2	2	1	3	3	0	1	12
FIRE RATING:SHAFTS__STAIRS T700 705&1006 ATRIUMS 414		6	1	1	5	0	2	15
INTERIOR OPENING PROT. T700,704.2, 705, 1005.3	2	3	0		8	0	2	15
CALC. FIRE RESISTANCE 709 INTERIOR FINISHES CH.8,T803.3	0	3	1	1	2	0	1	8
FIRE PROT:SPRK903 STDPIP904 ALARS905,SMOKE DETEC.905.2	2	8	1	3	10	0	3	27
OCCUP.LOAD T1003.1,TRAVEL DIST._DEADEND_T1004,1012.1.3	2	1	1	2	2	0	1	9
EGRESS WIDTH T1004, CH.10 # EXITS, STAIR/DOOR/CORR.	0	6	1	6	6	0	1	20
STAIR:PROT.1006,CONSTR. 1007 HZ.EXIT.1009 DISCHARGE 1010	0	10	1	3	12	0	5	31
DOORS 1012 RAMPS 1013 BALC.PORCH.1014 GURAIL 1015	2	2	2	5	9	0	3	23
EXIT:ILLUM.\$SIGNS 1016 SPECIAL EGRESS REQ.1018	1		2	5	10	0	1	19
HANDICAP REQ.VOL.1-C PARK. SPACES/RAMPS/TOILETS	14	25	1	17	28	0	8	93
LIGHT&VENTILATION CHAP.12 ENERGY VOL.1 CH.13 & VOL10	3	5	1	1	17	0	2	29
EXT.WALLCOV CHAP.14 ROOF CONSTR. CHAP.15	0	2	1	2	4	0		9
STRUC LOADS CH.1600 FOUND.CH18 CONCR. CH15	9	10	0	5	16	0	7	47
MASONRY CH20 STEEL CH22 WOOD CH23 GLASS CH24	2	7	1	6	10	0		26
GYP.BD.CH.25 PLASTIC CH26 CHIMNE CH28 ELEVATOR CH.30	2	0	1	0	12	0	1	16
TENT/WKWY/TUN CAN/SIGNS CH31,32,33	0	1	0	0	0	0	1	2
<b>TOTAL DEFECTS</b>	<b>60</b>	<b>124</b>	<b>29</b>	<b>86</b>	<b>189</b>	<b>3</b>	<b>65</b>	<b>551</b>

### SMALL PROJECT DEFECTS BY ELECTRICAL REVIEWERS

SMALL ELECTRICAL	GARY HARVELL (45)	GARY MULLIS (125)	JOHN WALLER (16)	JOE WEATHERS (18)	TOTAL # OF PROJECTS
EQUIPMENT CLEARANCES ART 110	3	12	1	3	19
OVERCURRENT DEV ON BRANCH ART 210,220,240	18	46	5	15	84
OVERCURRENT FEEDERS ART 220 & 240	6	20	2	15	43
GROUNDFAULT PROTECTION ART 230, 210-8	4	15	3	1	23
SERVICE CONDUCTORS ART 230	6	13	0	1	20
SERVICE EQUIPMENT LOCATION ART 230	10	16	3	3	32
SERVICE OVERCURRENT & AIC PROTECTION ART 230,110-10	2	11	1	6	20
LOAD CALCULATIONS	16	55	7	13	91
GROUNDINGELECTRODE/GROUND CONDUCTOR ART 250	8	13	1	4	26
SEPERATELY DERIV SYS GROUND ART 250	1	3	1	4	9
60DEG C RATED AMPACITY ART 110- 14 (C) (1)	3	7	2	2	14
CONDUCTORS/TYPE ART 310	6	24	2	4	36
WIRING METHODS	6	25	3	3	37
OVERCURRENT & AIC PANEL BOARDS ART 384,220,110-10	5	19	3	10	37
FIXED ELECTRICAL HEAT/AC ART 424/440	5	21	3	5	34
DISCONNECTS ART 422, 424, 430, 440, 680-12	9	33	5	8	55
MOTORS ART 430	5	11	2	8	26
OVERCURRENT PRIME SIDE DRY ART 450 TRANSF	0	4	0	1	5
OVERCURRENT SEC SIDE DRY ART 450 TRANSF	1	4	0	2	7
HAZARDOUS AREAS ART 500	4	11	1	3	19
ENERGY CODE REQ. 401 VOL 10	15	26	9	4	54
EMERGENCY SYSTEMS ART 700	0	10	1	2	13
EXIT LIGHTS ART 700	0	7	1		8
CONDUIT/RACEWAY FILL CHAPTER 9	2	20	2	2	26
SERVICERECEPTACLES&LIGHTS ART 210-63&70,620-23&24	1	10	0	0	11
SEALED PLANS	3	6	0	0	9
<b>TOTAL DEFECTS</b>	<b>139</b>	<b>442</b>	<b>58</b>	<b>119</b>	<b>758</b>

## LARGE PROJECT DEFECTS BY ELECTRICAL REVIEWERS

LARGE ELECTRICAL	GARY HARVELL (21)	GARY MULLIS (7)	JOHN WALLER (6A0)	JOE WEATHERS (47)	TOTAL # OF PROJECTS
EQUIPMENT CLEARANCES ART 110	5	2	0	17	24
OVERCURRENT DEV ON BRANCH ART 210,220,240	5	2	2	31	40
OVERCURRENT FEEDERS ART 220 & 240	4	3	2	21	30
GROUNDFAULT PROTECTION ART 230, 210-8	6	1	0	5	12
SERVICE CONDUCTORS ART 230	2	2	0	12	16
SERVICE EQUIPMENT LOCATION ART 230	5	4	2	15	26
SERVICE OVERCURRENT & AIC PROTECTION ART 230,110-10	1	1	3	13	18
LOAD CALCULATIONS	6	1	5	23	35
GROUNDINGELECTRODE/GROUND CONDUCTOR ART 250	2	3	3	17	25
SEPERATELY DERIV SYS GROUND ART 250	1	0	0	9	10
60DEG C RATED AMPACITY ART 110- 14 (C) (1)	0	1	1	10	12
CONDUCTORS/TYPE ART 310	4	3	0	11	18
WIRING METHODS	5	2	1	10	18
OVERCURRENT & AIC PANEL BOARDS ART 384,220,110-10	6	1	2	16	25
FIXED ELECTRICAL HEAT/AC ART 424/440	3	1	2	21	27
DISCONNECTS ART 422, 424, 430, 440, 680-12	3	3	1	4	11
MOTORS ART 430	4	1	2	17	24
OVERCURRENT PRIME SIDE DRY ART 450 TRANSF	0	1	0	3	4
OVERCURRENT SEC SIDE DRY ART 450 TRANSF	0	1	0	2	3
HAZARDOUS AREAS ART 500	2	1	0	6	9
ENERGY CODE REQ. 401 VOL 10	3	2	1	24	30
EMERGENCY SYSTEMS ART 700	0	2	0	3	5
EXIT LIGHTS ART 700	0	1	0	3	4
CONDUIT/RACEWAY FILL CHAPTER 9	3	2	1	3	9
SERVICERECEPTACLES&LIGHTS ART 210-63&70,620-23&24	1	0	0	5	6
SEALED PLANS	0	0	0	3	3
<b>TOTAL DEFECTS</b>	<b>71</b>	<b>41</b>	<b>28</b>	<b>287</b>	<b>444</b>

## SMALL PROJECT DEFECTS BY ZONING REVIEWERS

SMALL ZONING	JOHN EAVES (15)	RON JONES (22)	KAM MERRELL (32)	TOTAL SMALL (69)
PERMITTED USE	3		7	3
SETBACK:_____	3	5	9	8
TRANSITIONAL SETBACK: _____	1	0	4	1
SIDEARD L_____ R_____	3	0	9	3
REARYARD:_____	3	1	6	4
HEIGHT: MAXIMUM _____	1	0	2	1
BUILDING SEPARATION _____	0	0	1	0
LOT WIDTH: _____	0	0	0	0
LOT SIZE: _____	0	0	2	0
FLOOR AREA RATIO: _____	0	0	0	0
STREET ABUTMENT	0	0	0	0
PARKING REQUIRED: _____ SHOWN _____	3	12	7	15
LOADING SPACE REQUIRED _____ SHOWN _____	1	2	3	3
INTERIOR LANDSCAPING REQ _____ PROV _____	3	2	0	5
LIGHTING HEIGHT			3	0
SCREENING	8	16	17	24
BUFFERS	9	12	12	21
LETTER OF COMPLIANCE	8	9	13	17
DUMPSTER/TRASH HANDLING WITH SCREENING	5	13	9	18
BACKFLOW PREVEN. LOCATION ABOVE GR _____ BELOWGR _____	6	7	6	13
ZONING BOARD ADJUSTMENT CASE NO. _____	0	2	0	2
HISTORIC DISTRICT 336-2302 HISTORIC LANDMKS 376-9115	1	0	0	1
WATESHED SUBAREAS _____	0	0	0	0
CONDITIONAL USE APPROVED PLAND SUBMITTED ( )	0	0	0	0
PARALLEL CONDITIONAL USE APPROVED PLAN SUBMITTED( )	0	0	3	0
SUBDIVISION PLAN APPROVED PLANNING TO REVIEW	0	1	8	1
FLOODWAY 336-2713 COUNTY ENGINEERING	1	0	1	1
IMINENT ROAD PROJECT NC DOT- COUNTY ENGINEER	0	0	0	0
SIGNS: PERMITS REQUIRED ZONING 336-3569 OR 3570	0	0	0	0
<b>TOTAL DEFECTS</b>	<b>59</b>	<b>82</b>	<b>122</b>	<b>263</b>

## SMALL PROJECT DEFECTS BY ZONING REVIEWER

LARGE ZONING	JOHN EAVES (5)	RON JONES (87)	KAM MERRELL (14)	TOTAL LARGE PROJ. DEFECTS
PERMITTED USE	3	1	2	4
SETBACK:_____	0	6	4	6
TRANSITIONAL SETBACK: _____	0	11	0	11
SIDEYARD L_____ R_____	1	10	1	11
REARYARD:_____	1	7	2	8
HEIGHT: MAXIMUM_____	0	0	0	0
BUILDING SEPARATION_____	0	0	0	0
LOT WIDTH:_____	0	0	1	0
LOT SIZE:_____	0	0	1	1
FLOOR AREA RATIO:_____	0	0	0	0
STREET ABUTMENT	0	0	1	0
PARKING REQUIRED:_____	0	28	4	28
SHOWN_____				
LOADING SPACE REQUIRED____	0	14	0	14
SHOWN_____				
INTERIOR LANDSCAPING REQ_____ PROV_____	0	8	0	8
LIGHTING HEIGHT		6	1	6
SCREENING	2	50	10	52
BUFFERS	2	36	5	38
LETTER OF COMPLIANCE	1	32	4	33
DUMPSTER/TRASH HANDLING WITH SCREENING	1	39	6	40
BACKFLOW PREVEN. LOCATION ABOVE GR_____ BELOWGR_____	2	36	6	38
ZONING BOARD ADJUSTMENT CASE NO._____	0	3	0	3
HISTORIC DISTRICT 336-2302 HISTORIC LANDMKS 376-9115	0	0	0	0
WATESHED SUBAREAS_____	0	0	0	0
CONDITIONAL USE APPROVED PLAND SUBMITTED ( )	3	4	1	7
PARALLEL CONDITIONAL USE APPROVED PLAN SUBMITTED( )	0	1	2	1
SUBDIVISION PLAN APPROVED PLANNING TO REVIEW	0	45	4	45
FLOODWAY 336-2713 COUNTY ENGINEERING	0	2	0	2
IMINENT ROAD PROJECT NC DOT- COUNTY ENGINEER	0	0	0	0
SIGNS: PERMITS REQUIRED ZONING 336-3569 OR 3570	0	0	0	0
<b>TOTAL DEFECTS</b>	<b>16</b>	<b>339</b>	<b>55</b>	<b>410</b>

## SMALL PROJECT DEFECTS BY FIRE REVIEWERS

SMALL FIRE	WILLIAM LAMAY (10)	TOTAL SMALL (10)
AVAILABLE WATER SUPPLY	3	3
FIRE DEPARTMENT ACCESS	1	1
FIRE HYDRANT SPACING	5	5
PRIVATE FIRE MAIN	0	0
SPRINKLER SYSTEM	6	6
STANDPIPE SYSTEM	0	0
FIRE PUMP	0	0
PORTABLE FIRE EXTINGUISHER	1	1
FIRE ALARM SYSTEM	3	3
SMOKE DETECTION SYSTEM	0	0
FIXED EXTINGUISHING SYSTEM	0	0
EVACUATION PLAN	0	0
ELECTRICAL WIRING & EQUIP	0	0
VENTILATION SYSTEM	0	0
GENERAL STORE	1	1
EMERGENCY GENERATOR	0	0
HAZARDOUS MATERIALS	0	0
COMPRESSES OR LIQUID GASES	0	0
COMBUSTIBLE DUST PRODUCING OPER	0	0
FLAMMABLE FINISHING	0	0
FLAMMABLE & COMBUSTIBLE	0	0
WELDING & CUTTING	0	0
EXPLOSIVE MATERIALS	0	0
FIRE DEPT. PERMIT	0	0
EXITS	0	0
INTERIOR FINISHERS	0	0
DECORATIONS & FURNISHING	0	0
<b>TOTAL DEFECTS</b>	<b>20</b>	<b>20</b>

## LARGE PROJECT DEFECTS BY COUNTY FIRE REVIEWERS

LARGE FIRE	WILLIAM LAMAY (10)	TOTAL # LARGE PROJECT DEFECTS
AVAILABLE WATER SUPPLY	0	0
FIRE DEPARTMENT ACCESS	11	11
FIRE HYDRANT SPACING	5	5
PRIVATE FIRE MAIN	22	22
SPRINKLER SYSTEM	0	0
STANDPIPE SYSTEM	7	7
FIRE PUMP	0	0
PORTABLE FIRE EXTINGUISHER	0	0
 FIRE ALARM SYSTEM	 2	 2
SMOKE DETECTION SYSTEM	11	11
FIXED EXTINGUISHING SYSTEM	4	4
 EVACUATION PLAN	 4	 4
ELECTRICAL WIRING & EQUIP	0	0
VENTILATION SYSTEM	1	1
GENERAL STORE	1	1
EMERGENCY GENERATOR	3	3
HAZARDOUS MATERIALS	0	0
COMPRESSES OR LIQUID GASES	0	0
 COMBUSTIBLE DUST PRODUCING OPER	 0 0	 0 0
FLAMMABLE FINISHING	0	0
FLAMMABLE & COMBUSTIBLE	0	0
WELDING & CUTTING	0	0
EXPLOSIVE MATERIALS	0	0
FIRE DEPT. PERMIT	0	0
EXITS	0	0
INTERIOR FINISHERS	0	0
DECORATIONS & FURNISHING	0	0
 <b>TOTAL DEFECTS</b>	 <b>71</b>	 <b>71</b>

## SMALL PROJECT DEFECTS BY MECHANICAL REVIEWERS

SMALL MECHANICAL	WILLIS HORTON (2)	TYLER PACE (29)	CHARLIE SUTTON (12)	GLENN SNYDER (2)	TOTAL # OF PROJECTS
EQUIPMENT APPROVAL	1	17	6	1	25
EQUIPMENT ACCESSIBILITY	1	6	0	2	9
CODENSATE DRAIN PIPING	1	6	2	1	10
VENTILATION/EXHAUST SYS	1	9	5	2	17
FAN SHUTDOWN CONTROLS	2	7	2	2	13
KITCHEN EXH. & MHU SYSTEM	1	5	1	3	10
CLOTHES DRYERS		3	0	0	3
DUCT CONSTRUCT/MATERIALS	2	8	1	0	11
PLENUMS	1	4	0		5
FIRE/RADIATION/SMOKE DMPRS		8	2	2	12
COMBUSTION/VENTILATION AIR	1	2	0	0	3
CHIMNEY & VENTS	2	2	0	0	4
BOILERS		1	0	0	1
GAS PIPING	1	12	2	2	17
APPLIANCE COMBUSTION AND VENTILATION AIR, CHAPTER	1	2	0	0	3
CLEARANCES (RTU)		1	0	0	1
SPECIFIC APPLIANCES	1	2	0	0	3
VENTING OF APPLIANCES	1	2	0	0	3
VENT TERMINATION	2	5	0	0	7
SMOKE VENTING(HIGH RISE)		1	0	0	1
ATRIUMS (SMOKE VENTING)		1	0	0	1
SEALED PLANS		1	0	0	1
<b>TOTAL DEFECTS</b>	<b>19</b>	<b>105</b>	<b>21</b>	<b>15</b>	<b>160</b>

## LARGE PROJECT DEFECTS BY MECHANICAL REVIEWERS

<b>LARGE MECHANICAL</b>	<b>WILLIS HORTON (15)</b>	<b>TYLER PACE (11)</b>	<b>CHARLIE SUTTON (3)</b>	<b>GLENN SNYDER (9)</b>	<b>TOTAL # OF PROJECTS</b>
EQUIPMENT APPROVAL	9	5	0	2	16
EQUIPMENT ACCESSIBILITY	3	0	0	3	6
CODENSATE DRAIN PIPING	8	3	1	2	14
VENTILATION/EXHAUST SYS	9	3	2	3	17
FAN SHUTDOWN CONTROLS	12	6	1	6	25
KITCHEN EXH. & MHU SYSTEM	7	2	0	2	11
CLOTHES DRYERS	4	0	0	3	7
DUCT CONSTRUCT/MATERIALS	1	4	0	3	8
PLENUMS	0	2	0	3	3
FIRE/RADIATION/SMOKE DMPRS	8	4	1	4	17
COMBUSTION/VENTILATION AIR	7	0	0	3	10
CHIMNYE & VENTS	10	2	0	3	15
BOILERS	2		0	0	2
GAS PIPING	6	2	0	3	11
APPLIANCE COMBUSTION AND VENTILATION AIR, CHAPTER	7	1	0	4	12
CLEARANCES (RTU)	2	0	0	0	2
SPECIFIC APPLIANCES	5	1	0	3	9
VENTING OF APPLIANCES	8	1	0	3	12
VENT TERMINATION	11	3	0	1	15
SMOKE VENTING(HIGH RISE)	0	0	0	0	0
ATRIUMS (SMOKE VENTING)	0	0	0	0	0
SEALED PLANS	0	0	0	0	0
<b>TOTAL DEFECTS</b>	<b>119</b>	<b>39</b>	<b>5</b>	<b>51</b>	<b>212</b>

## SMALL PROJECT DEFECTS BY PLUMBING REVIEWERS

SMALL PLUMBING	WILLIS HORTON (1)	TYLER PACE (30)	GLENN SNYDER (5)	CHARLIE SUTTON (16)	TOTAL # OF PROJECTS
MINIMUM FACILITIES	1	8	0	5	14
DRAIN BELOW SEWER LEVEL	0	0	0	0	0
PROTECTION FROM FREEZING	0	1	1	0	2
FITTINGS/OBSTRUCTION TO FLOW	0	1	0	0	1
FIXTURE REQUIREMENTS	0	13	0	2	15
HANDICAP REQUIREMENTS	1	7	0	3	11
PRIVACY SCREENING	0	2	1	0	3
FLOOR DRAININGS	0	6	1	0	7
ACID WASTE PIPING	0	1	1	0	2
WATER HEATERS/BOILERS	1	10	0	5	16
WATER PIPING REQUIREMENTS	1	12	1	2	16
BACKFLOW PROTECTOR	1	12	2	5	20
MATERIAL, TABLES	1	12	1	1	15
DRAIN PIPE INSTALLATION	1	13	1	3	18
CLEANOUTS/TRAPS	0	5	1	1	7
FIXTURE UNITS	0	1	0	0	1
INDIRECT WASTE	0	1	0	0	1
VENT STACKS/STACK VENTS MAIN VENT	0	7	2	6	15
FIXTURE VENTS	0	8	0	4	12
BATTERY VENTING	0		2	0	2
COMBINATION WASTE AND VENT	0	1	3	0	4
INTERCEPTORS 1004 OIL/GREASE/SAND/LINT/ACID	1	7	0	1	9
ROOF DRAINS 1107	0	0	0		0
EMERGENCY ROOF DRAINS 1109/SCUPPERS	0	0	0	0	0
SEALED PLANS	0	1	0	1	2
<b>TOTAL DEFECTS</b>	<b>8</b>	<b>129</b>	<b>17</b>	<b>39</b>	<b>193</b>

## LARGE PROJECT DEFECTS BY PLUMBING REVIEWERS

<b>LARGE PLUMBING</b>	<b>WILLIS HORTON (21)</b>	<b>TYLER PACE (31)</b>	<b>GLENN SNYDER (9)</b>	<b>CHARLIE SUTTON (3)</b>	<b>TOTAL # OF PROJECTS</b>
MINIMUM FACILITIES	7	9	1	2	19
DRAIN BELOW SEWER LEVEL	3	4	0	0	7
PROTECTION FROM FREEZING	4	3	1	0	8
FITTINGS/OBSTRUCTION TO FLOW	2	1	4	0	7
FIXTURE REQUIREMENTS	6	11	1	1	19
HANDICAP REQUIREMENTS	4	14	6	0	24
PRIVACY SCREENING	2	1	1	0	4
FLOOR DRAININGS	7	6	1	0	14
ACID WASTE PIPING	0	1	0	0	1
WATER HEATERS/BOILERS	13	9	3	0	25
WATER PIPING REQUIREMENTS	17	17	4	1	39
BACKFLOW PROTECTOR	11	14	2	1	28
MATERIAL, TABLES	9	6	4	0	19
DRAIN PIPE INSTALLATION	14	17	3	1	35
CLEANOUTS/TRAPS	8	10	7	0	25
FIXTURE UNITS	2	1	0	0	3
INDIRECT WASTE	2	0	1	0	3
VENT STACKS/STACK VENTS MAIN VENT	4	7	1	1	13
FIXTURE VENTS	9	9	2	0	20
BATTERY VENTING	6	1	1	0	8
COMBINATION WASTE AND VENT	5	1	1	0	7
INTERCEPTORS 1004 OIL/GREASE/SAND/LINT/ACID	10	12	0	0	22
ROOF DRAINS 1107	10	4	2	0	16
EMERGENCY ROOF DRAINS 1109/SCUPPERS	9	2	1	0	12
SEALED PLANS	0	0	0	1	1
<b>TOTAL DEFECTS</b>	<b>164</b>	<b>160</b>	<b>47</b>	<b>8</b>	<b>379</b>

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# Meeting Notes